

Licensable Technologies

Carbon Dioxide Decomposition

Applications:

- Green energy

Benefits:

- Possible application in green energy technologies

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Summary:

The purpose of the project is to create a reactor plasma torch, with two-stage heating of the gas to high temperatures for conversion of CO_2 into $\text{CO} + \text{O}$. CO is a useful gas that is one component of syngas, which can be burned in boilers, furnaces, etc. If a syngas plant is located close to a CO_2 source, two useful conditions exist: CO_2 can be converted into a useful product (rather than being emitted into the atmosphere as a harmful greenhouse gas), and produced CO can be used to adjust the CO -to- H_2 balance in the syngas plant. The power supply proposed to be developed under this project will be considerably more efficient using such a conversion process.

The creation of a "current source," not a "voltage source," which is used currently in plasma technologies (the Sukhumi Institute has developed a laboratory model with 8 kW) for plasma reactors (PRs), has many advantages:

- The plasma source and the PR are a single unit;
- Cooling systems are not needed;
- The electricity consumption for such a PR is <40%;
- A PR is low in cost;
- The work of a PR is stable because of its innovative "current source";
- Plasma torches are not needed;
- The technology has high performance and saves energy compared with that currently used;
- The initial investment and operating costs are low;
- The power of a PR is unlimited (can be from 5 kW up to 60 MW); and
- Other materials may also be integrated with the plasma process to increase the efficacy of CO_2 decomposition.

Development Stage:

Los Alamos National Laboratory and the Sukhumi Institute of Physics and Technology, Georgia, are in the initial stages of proposal development, based on the previously performed limited testing.

Patent Status:

No patent applications have been filed yet for the technology to be developed under this project.

Licensing Status:

This technology will be available for licensing once the project is developed.